

Structures, Processes, and Responses of Plants

6-2 The student will demonstrate an understanding of structures, processes, and responses of plants that allow them to survive and reproduce. (Life Science)

6-2.8 Explain how plants respond to external stimuli (including dormancy and the forms of tropism known as phototropism, gravitropism, hydrotropism, and thigmotropism).

Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/future knowledge: In 3rd grade (3-2.4), students studied how plants respond to changes in their environments, specifically their response to light. Students in 3rd grade also studied the concept of gravity as a pull on an object. In 4th grade (4-2.4), students studied plant behaviors in response to light, water, touch, and gravity in the environment.

It is essential for students to know that plants respond to changes in their environments. These responses (the reply to the change in the environment, or stimulus) vary depending on the specific environmental stimulus (a change in the environment that causes a response or a reaction).

Under certain conditions, when a mature plant or seed becomes or remains inactive, it is said to be *dormant*.

- *Dormancy* is a period of time when the growth or activity of a plant or seed stops due to changes in temperature or amount of water.
- Dormancy allows various species to survive in particular environments.
- It helps to ensure that seeds will germinate when conditions are favorable for survival of the small seedlings.
- For example, leaves fall from trees prior to the conditions of winter and the leaf buds do not open again until conditions are favorable in the spring.

Plants respond to changes in the environment by growing or moving their stems, roots, or leaves toward or away from the stimulus. This response, or behavior, is called a *tropism*. Examples of plant tropisms include:

Phototropism

- The way a plant grows or moves in response to light

Gravitropism

- The way a plant grows or moves in response to gravity; also called *geotropism*

Hydrotropism

- The way a plant grows or moves in response to water

Thigmotropism

- The way a plant grows or moves in response to touch

It is not essential for students to know other tropisms, negative or positive tropisms, or the internal causes for tropisms.

Structures, Processes, and Responses of Plants

6-2 The student will demonstrate an understanding of structures, processes, and responses of plants that allow them to survive and reproduce. (Life Science)

Assessment Guidelines:

The objective of this indicator is to *explain* how plants respond to external stimuli; therefore, the primary focus of assessment should be to construct a cause-and-effect model of plants responding to external stimuli through dormancy or tropisms. However, appropriate assessments should also require student to *identify* the responses of plants including dormancy and tropisms; *exemplify* tropisms in plants; or *illustrate* the forms of tropism using words, pictures, or diagrams.